AOP4, ArtFuel, and Training

CUTEC NEWS

FACTS · INFORMATION · ANALYSES

Nr_3 www.cutec.de October 2005

Green Gas and ArtFuel

During the past weeks and months, unpleasant surprises at filling stations have been the order of the day: Fuel prices have increased continuously. So far, the immediate effect of current crude oil prices has not really been all that severe; after all, taxes are still the major cost factor, at least in Germany. Nevertheless, the situation may change soon. In all probability, the days of "cheap oil" are gone forever. At present, 45 dollars per barrel can be regarded as a real bargain. During the interim, OPEC has been supporting a crude oil price of 50 dollars per barrel, but the level has already exceeded 60 dollars. For the coming years, analysts predict a price increase to values exceeding 100 dollars per barrel. The obvious question is whether or not we should simply accept this development without doing anything about it. Of course, the answer is "no". A magic word in this context is biomass, since liquid fuels can be produced from biomass. This topic will be considered in more detail later. On the other hand, anaerobic digestion also yields fuel: biogas. Whether from plants, manure from cattle or swine, organic wastes – biogas can be generated from a wide variety of input materials. Green gas is especially in demand at present, since its use is assisted by fiscal policy. However, for obtaining fuel of natural gas quality with a content of more than 97 per cent methane as combustible component from biogas, certain components must be removed from the biogas: Hydrogen sulphide is a highly toxic, corrosive gas with a disagreeable odour and the ability to poison catalysts; carbon dioxide decreases the calorific value of the fuel. Subsequently, the green gas can be delivered to the public gas network or employed as fuel for motor vehicles which have been modified appropriately, for instance. You may be asking what all of this has to do with CUTEC. With our Department of Physical and Biological Processes, we have been active in the field of biogas research for quite some time and have also developed products for the market. In this context, I wish to recall the development of a gas-measuring cell and the sludge conditioning process. For the future, we intend to continue expanding the Division of Biological Process Engineering to form a vital strategic building block at the Institute. For this purpose, cooperation with universities, external research institutions, and industrial companies will also be of increasing importance. Read all about this project in our report on page 4 of this issue.

His first visit at CUTEC: Minister of the Environment Sander (r.) is cordially welcomed by Prof. Carlowitz (l.)

In several past issues of CUTEC-News, we have already reported on the progressing work on our ArtFuel pilot plant for the production of synthetic fuels from biomass. A special event on the CUTEC calendar was the official dedication of the plant by Lower Saxony's Minister of the Environment Sander on 5th August. A detailed report on the ceremony is presented on page 3.

Yours sincerely, Otto Carlowitz

IN THIS ISSUE

CUTEC successfully completes "industrial fair triathlon"

Participation in Energy, IFAT and LIGNA

There was plenty of work for CUTEC's "industrial fair team" during the past spring season. Upon invitation by the Chamber of Agriculture, CUTEC presented an ArtFuel exhibit at Lower Saxony's stand, which was shared by several companies and institutions at the Hannover Energy Fair (11th to 15th April). The object on display was a model of the pilot plant in which synthetic fuel is produced from biomass in a multistage process at CUTEC. Lower Saxony's Minister of the Environment Sander was among the numerous visitors

Prof. Carlowitz (r.) explains the ArtFuel exhibit to Minister of the Environment Sander (l.) and to Mr Grübmeyer

Continued on page 6

EU COST expert commission meets at CUTEC

On 25th and 26th April, the language confusion attained quasi-Babylonian proportions in the entrance hall of Clausthaler Umwelttechnik-Institut GmbH (CUTEC). For two days, representatives from the member countries of the COST Environmental Expert Commission convened for a business meeting in Clausthal-Zellerfeld – which was held in English, of course. As hosts, the Managing Director of CUTEC, Prof. Carlowitz, and Dr. Onyeche welcomed the international delegation. Prof. Carlowitz is one of the two German representatives in this commission, and Dr. Onyeche is his deputy.

COST is an acronym – COopération européenne dans le domaine de la recherche Scientifique et Technique – and has stood for European cooperation in the field of scientific and engineering research since its establishment in 1971. The purpose of COST is to consolidate European research institutions, universities, and industrial companies for realising joint research projects. At present, 34 countries, including the 25 EU member countries and Israel as cooperating country, are members of COST. The objective is to concentrate national research projects in concerted actions on various topics and thus to effectively utilise available knowledge, technical facilities and equipment as well as financial resources throughout Europe and to create sustainable networks. Since the choice of COST topics is basically an open question, the activities in progress in different scientific fields are highly diverse; environmental engineering is one of the fields which are receiving special attention.

During the two-day event, Prof. Carlowitz, Dr. Onyeche, and Mr Siemers described the range of scientific activities at CUTEC to the members of the committee. During the visiting tour through the Institute, the possibilities of cooperating with CUTEC on a European level in the field of environmental engineering were intensively discussed. (he)

The participants in the conference became acquainted with CUTEC

ISFH meets CUTEC

Employees of the two institutes during the visiting tour

The employees of the Management, Commercial, and Accounting Departments at the Institut für Solarforschung in Hameln (ISFH) visited CUTEC-Institut on 20th May, together with the Head of the Management Department, Dipl.-Oec. Gaßdorf.

As is the case with CUTEC, ISFH is a non-profit organisation whose sole shareholder is the Federal State of Lower Saxony. The activities at ISFH include research and development in the fields of solar energy, as well as continuing education.

The visit, as emphasised by the business manager at CUTEC, Dipl.-Volksw. Sommer, upon welcoming the guests, is intended to encourage the exchange of experience and information which result from the similar activities and structures of the two institutions. The Management Department of ISFH comprises a Technical Division with IT support, an electronics workshop, and a mechanical workshop, as well as the Administrative Division, including Accounting, secretaries' offices, and Public Relations Services.

Thus, the ISFH employees had the opportunity to become acquainted with the operative structure of CUTEC, its technical facilities and equipment, and the possibilities of performing scientific work, as well as the CUTEC employees in the central service departments and the corresponding fields of activity. From the exchange of information, it was obvious that many tasks appear to be the same, but are accomplished in a different way. Things common to employees at both institutes quickly became evident, and the resulting need for discussion was enormous.

The day was concluded with a joint visit to the hydropower plant of the Harz-Wasserwerke on the River Oker, as well as the Oker Dam itself.

Everybody agreed that this means of keeping in touch and encouraging dialogue should be continued. (so)

Delegation from Brazil visits CUTEC

The synthesis of fuel from renewable raw materials is a field of development all over the world. In Europe, more emphasis is placed on rape methyl ester (RME) or synthetic fuels, whereas domestic resources from sugar cane are utilised for ethanol production in the countries of South America, especially Brazil. Nevertheless, the mutual interest in alternatives is great.

Within the scope of a project funded by the German Federal Government, the Brazilian Environmental Technology Cooperation, organised by InWEnt*, a delegation from Brazil visited the Departments of Thermal and Chemical Processes on 20th April 2005. In the course of a conference followed by a visiting tour of the ArtFuel plant, representatives from local politics, trade unions, universities, and industrial associations discussed the chances and limitations of the concept pursued at CUTEC with Dr. Vodegel and Mr Maly. The presence of a member of the Brazilian President's advisory group, R. A. Rodrigues, imparted special importance to the event. Mr Rodrigues coordinates the national Biodiesel program. (vd)

* Successor organisation to the Carl Duisberg Gesellschaft and the Deutsche Stiftung für Internationale Entwicklung

Dedication of the ArtFuel plant:

Lower Saxony's Minister of the Environment Sander presses the 'start' button

On Friday, 5th August 2005, Lower Saxony's Minister of the Environment, Hans-Heinrich Sander, officially dedicated the Institute's pilot plant for the production of synthetic fuel (ArtFuel) from biomass. In the presence of invited guests from politics, associations, industrial companies, and research institutes in the fields of agriculture and forestry, plant design and construction, as well as waste treatment management, the minister emphasised the will of the Government of Lower Saxony to promote innovative projects, despite the scarcity of funds. Of particular interest are those fields of development which contribute to the stability of the agricultural and automotive State of Lower Saxony.

In his welcoming address, Prof. Carlowitz emphasised that the realisation of the plant would not have been feasible without the assumption of the project management by the Institute as well as tendering and awarding of the technical work in individual lots. He also referred to the numerous activities at CUTEC in the field of renewable energy sources during the interim. In a concluding ceremony, he gave Minister Sander a bottle of raw Fischer-Tropsch product from the Institute's own plant, labelled "ArtFuel – made in Lower Saxony by CUTEC".

In the pilot-plant hall, Dr. Vodegel, Head of the Department of Thermal Processes, explained the concepts of thermal decomposition and gas purification. Photographs of the progressing construction as well as energy- and mass-balance diagrams from the initial trial runs provided the guests with a clear-cut insight into the construction and operation of the plant. Several companies, especially among the small and medium-sized enterprises, were expressly praised because of their willingness to lower their prices to the tolerable limit during the construction phase. Dr. Vodegel hopes that this "sacrifice" will prove to be a rewarding investment for the companies concerned, and that the ArtFuel plant will serve as a convincing reference object for the introduction to business in the future.

Dr. Vodegel (r.) described the structure of the ArtFuel plant to numerous guests …

Dipl.-Chem. Maly from the Department of Chemical Processes described the processing of the purified synthesis gas. He presented initial results and explained the advantages of the synthetic fuel (fewer problems with fine dust, purity of the fuel, absence of sulphur, feasibility of new engine designs).

With a press of the famous "start" button, Minister Sander officially commissioned the ArtFuel plant. With due applause from the auditorium, fans, worm conveyors, and lamps started operation and provided an impression of pilot-plant operation for the visitors.

During the barbecue which concluded the event, the guests from widely differing fields of operation had the opportunity to become mutually acquainted. (vd)

… before Minister of the Environment Sander (centre) officially commissioned the plant by pressing the 'start' button. In the foreground: Mr Grübmeyer (l.) and Prof. Carlowitz (r.)

CUTEC invitation to the workshop: "Selective separation technology in downstream processing"

The key word "downstream processing" encompasses steps for the isolation and purification of products from fermentation broths. The biological synthesis of industrial chemicals, for instance, for the manufacture of pharmaceuticals, cosmetics, etc., belongs to the so-called white biotechnology* class, one of the few growing markets for German companies. For maintaining the leading position of Germany's chemical industry and for tapping the enormous potential offered by this market in the future, interdisciplinary cooperation will be considerably more important than it was in the past. This requirement has also been recognised by leading specialists in various fields from industry and research. For utilising this potential, a workshop on "Selective separation technology in downstream processing" was held at CUTEC by the GVC-Dechema specialised committee, "Production-integrated water / waste-water technology" on 9th and 10th June. With Prof. Räbiger from the University of Bremen as coordinator, this committee organises workshops on various topics at regular intervals; the workshops are held on the premises of one of the committee members. This year, Dr. Sievers, Head of the Department of Biological and Physical Processes, was responsible for the local organisation and coordination of the event.

The presence of about 60 participants in various fields, including representatives from all major chemical and pharmaceutical companies in Germany as well as numerous leading universities underscored the importance of the workshop. Furthermore, a new interdisciplinary ad hoc working group, "Selective separation techniques for sustainable production", was also established in the course of the workshop. The purpose of this working group is to encourage cooperation among the different fields involved, from microbiology / biotechnology, chemistry, pharmacy, through process engineering (particle technology, chromatography, membrane technology, crystallisation, thermal separation processes, etc.) all the way to plant engineering. One approach is to begin at a very early stage in the process chain, that is, with the biological processes, and to optimise these processes in such a way that the cost-intensive product isolation and recovery steps are simplified and thus economised as far as possible. The application of hybrid processes, that is, the combination of two different processes in a single apparatus, is also viewed as a significant option.

Sincere thanks were expressed to all CUTEC employees concerned for the exemplary organisation of the event. (siev)

* For an explanation of the term "white biotechnology", see the figure on page 4

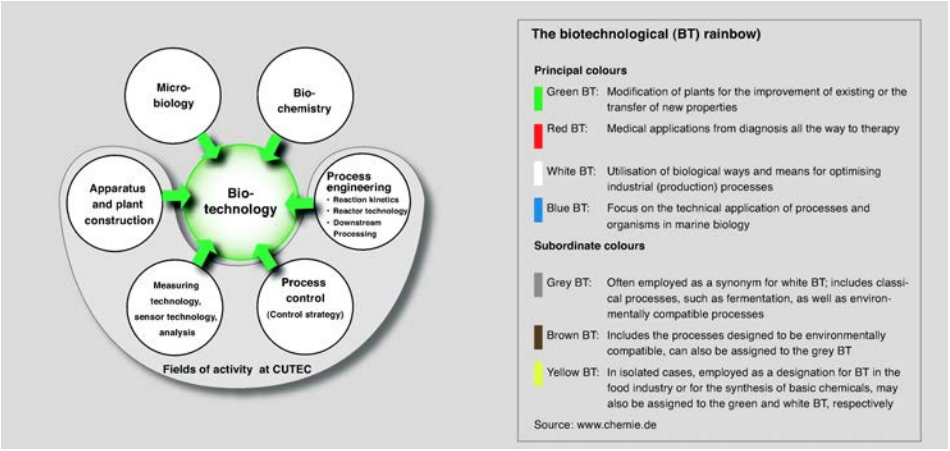
In the upwind: biological process engineering at CUTEC

It all began with high-performance compact reactors for the biological treatment of waste water in the early the 1990's. Under the leadership of Prof. Vogelpohl, a member of the CUTEC Board of Directors at the time, initial experience was gained with the development of compact bioreactors as well as dynamic modelling of biological waste water treatment processes. Even at that time, special attention was paid to process combinations which are characterised by synergetic effects and are thus more efficient as a whole than a simple succession of individual processes. As the developmental work gradually progressed, increasing emphasis was automatically placed on the treatment of the by-products, too; these include both the sludge and the associated sludge water. In a figurative sense, the sludge treatment can also be regarded as "downstream processing"; from this standpoint, therefore, the association with biotechnological problems is immediate.

In order to characterise biological process engineering at CUTEC, let us consider the biotechnological "rainbow". Besides green, white, and red biotechnology, which are probably well known to many of our readers, blue, grey, and yellow biotechnology also exist (see the preceding figure). In view of the rapid development in this field, the appearance of further colours in the future can also be expected. The work in progress at CUTEC can best be designated in grey and brown. In other words, not only processes for the biological treatment of waste water and solid waste are under investigation. With the application of biological methods, manufacturing processes are also being designed to be more compatible with the environment. In these endeavours, special attention has been paid to economic objectives, such as the reduction of investment and operating costs, as well as ecological objectives, saving of resources, and reduction of emissions.

In the editorial, two examples – the biogas-measuring instrument and the process for sewage-sludge homogenisation – are cited. Both have already passed through the development pipeline with success and constitute a good basis for future developments in the field of biogas / green gas. These techniques are described in more detail at www.cutec.de.

Special emphasis is currently being placed on "enhancing the efficiency of bio-



Biological process engineering at CUTEC

processes" for supplying energy (biogas, biofuel). An important example is the production of biogas from plants which are contaminated with heavy metals, such as those which may result from phytodecontamination (that is, extraction of contaminants from the soil by plants suited for the purpose). Selective extraction of heavy metals from the anaerobic process offers the possibility of recycling biosolids to the fields after removal of the heavy metals. Under the provisions of the Law Relating to Renewable Energy Sources (Gesetz für Erneuerbare Energien, EEG) soil remediation is economically feasible in areas contaminated with heavy metals. Another example is the stimulation of microorganisms with ultrasonic waves of low intensity far below the cavitation range. For bioethanol synthesis with yeast cells, for instance, a significant increase in the specific volumetric yield has been achieved. A project for optimising biogas reactors is also planned; for this purpose, the bench-scale plant will be expanded with the construction of a two-train continuously operated anaerobic digestion unit, among other features.

As a support for further developmental steps in these fields, the biolaboratory apparatus has also been considerably expanded, especially with the acquisition of a (U)HPLC-MS/MS unit as well as a microtitre-plate reader with a pipetting robot. The acquisition of a gel chromatograph (electrophoresis) as well as the development of an online-sensor system for determining gas concentrations in the presence of extremely small quantities of gas have already been envisaged. These additions will provide entirely new analytical possibilities, not only for optimising bioprocesses, but also for downstream processing, including recovery and purification of the product. The latter aspect is of increasing importance in the field of biotechnology because of the high cost of product recovery and purification. In this context, be sure to read the report on the workshop, "Selective separation technology in downstream processing", on page 3. (siev)

Maltese Minister visits CUTEC

Since September 2004, a declaration of intent has been in force between CUTEC and the Maltese Government. The objective of this agreement is sustainable development in Malta. This project was initiated by Prof. Bernd Heins and by the Maltese Minister of the Infrastructure and Resources, Ninu Zammit, who are also responsible for its coordination.

In the course of the cooperation, the Minister has visited Germany in order to obtain information on the possible uses of renewable energy sources. During his visit at CUTEC, Minister Zammit was impressed by the wide variety of possible applications. In this context, the use of solar energy for the desalination of drinking water and the Energy Park were of special interest to him. (hn)

Minister Zammit (centre) and Mr Stefano (r.) listened to Prof. Carlowitz' (l.) explanations with great interest

AOP4: 4th International Conference on Advanced Oxidation Processes for Water and Waste Water Treatment

The AOP3 scientific committee in Goslar in May 2003

Together with the Technical University of Clausthal (Prof. Vogelpohl) and the Technical University of Berlin (Prof. Geißen), CUTEC will organise another International Conference on Advanced Oxidation Processes for Water and Waste Water Treatment in May 2006. During this conference, special emphasis will be placed on the elimination of anthropogenic substances and endocrine-disrupting chemicals, such as pharmaceuticals. The conference will be held under the umbrella of the IWA (International Water Association), London UK, and will be the fourth of its kind. For interested specialists, an application form is included with this issue of CUTEC News. Furthermore, authors may register with an abstract of their own (oral presentation or poster) prior to 30th September, either by fax, 05323 933-100, or by e-mail at aop4@cutec.de. The application form and information on the required abstract can be downloaded at www.cutec.de/aop4. The last conference took place in 2003, likewise in Goslar, and was attended by just about 200 participants from about 40 countries. At that time, the excellent organisation and the high scientific level of the conference received special praise. (siev)

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Edithor: Dr. T. Heere
Authors:
Prof. Dr.-Ing. O. Carlowitz (ca)
Dr. T. Heere (he)
Dipl.-Ing. A. Henze (hn)
Dipl.-Ing. D. Perbandt (pe)
Dipl.-Ing. T. Reindorf (rd)
M. Röneke (rö)
Dr.-Ing. M. Sievers (siev)
Dipl.-Vw. K.-R. Sommer (so)
Dr.-Ing. S. Vodegel (vd)
V. Wessels (ws)
Layout and setting: G. Wessels (wes)
Photos: Gert-E. Knochen
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CUTEC-Institut GmbH
Leibnizstr. 21+23
D-38678 Clausthal-Zellerfeld
Phone. +49 5323 933-0 · Fax +49 5323 933-100
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TELEFAX

To: CUTEC-Institut GmbH
Dr.-Ing. Michael Sievers

Fax-No. +49 5323 933-100

REPLY FORM – REGISTRATION AOP4

4th International Conference on
Oxidation Technologies for Water and Wastewater Treatment
Special Topic: Recalcitrant and Anthropogenic Mikropollutants
15 – 17 May 2006 / Conference-Hotel „Achtermann“, Goslar, Germany

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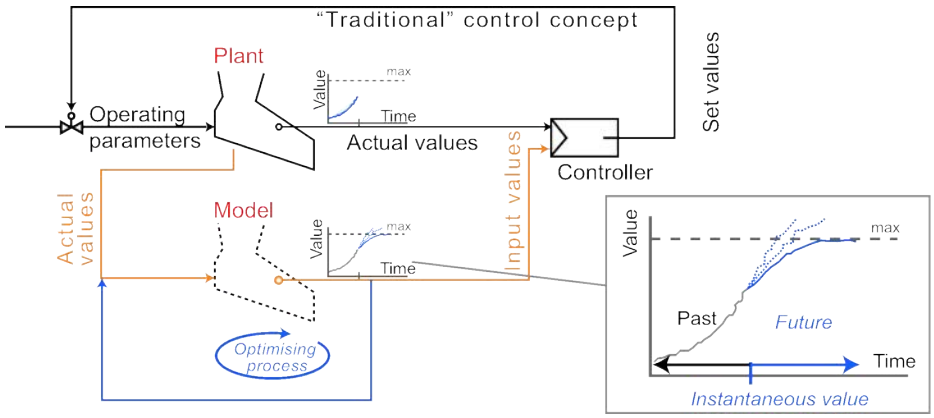
Interdisciplinary cooperation: the predictive controller

Department of Thermal Processes cooperates with the Department of Modelling and Simulation

Take a look into the future? Not just knowledge, but also open- and closed-loop control of what is happening? Who would not like to realise this ancient human dream and even experience it himself?

Developments in the field of measuring and control technology have progressed by leaps and bounds with the increasing availability of high-speed electronic communications systems during the past ten years. Traditional PID technology has received additional support from two strategical approaches: Despite the more or less opposite orientation of the operating principles, both tools are derived essentially from human behaviour. With the application of so-called fuzzy logic, experience gained by operating personnel, non-numerical relationships, and similar information are converted to control strategy. In the case of so-called neural networks, on the other hand, mathematical algorithms "learn" from operational data. The application of these techniques was initially limited to small devices, such as household appliances; since the turn of the century, however, applications have been extended to industrial systems technology.

In the specialised field of thermal waste treatment at the Department of Thermal Processes, a vital objective is the development of efficient control systems for commercial plants. The main reason for this requirement is the variation in fuel properties, which makes it difficult to satisfy the consumer demand for a constant and adjustable delivery of steam and electric power. In cooperation with the Department of Modelling and Simulation, an idea has therefore been developed to yield a concept which combines the most advanced PID control systems, fuzzy logic, and neural networks with a mathematical model which simulates the physical and chemical processes involved. The purpose of the model is to determine the current status from the actual data, including their past values, and predict the further development. Thus, the control system is capable of intervening in a predictive manner (see the preceding figure).



Operating principle of the predictive control system

During the interim, a positive decision on the project has been reached by AiF (Arbeitsgemeinschaft industrieller Forschung – Working Association for Industrial Research). Together with a project-support committee comprising members from original equipment manufacturers, operating companies, and VGB, CUTEC is now waiting for release of the funds from BMWA in Berlin. As soon as this has been achieved, a promising, future-oriented field of activity, which can also be expanded to accommodate further applications, will be open to the participating departments.

(vd)

Continuation from page 1

CUTEC successfully completes "industrial fair triathlon"

from all over the world, to whom the functional principle of the plant was explained by specialised personnel. Mr Sander was also welcomed at the stand by the Managing Director of CUTEC, Professor Dr.-Ing. Carlowitz, and by Mr Grübmeyer (see photo). The freshly printed anniversary issue of CUTEC-News had been completed on time for the beginning of the fair and was thus available to the visitors on the occasion of the 15-year founding anniversary of Lower Saxony's CUTEC-Institute. A word of congratulation by the Prime Minister of Lower Saxony, Christian Wulff, was presented on the front page.

Only ten days later, CUTEC was present at two locations simultaneously at IFAT in München, the world's leading environmental and waste-treatment fair: at the stand of the Deutsche Bundesstiftung Umwelt (DBU – German Federal Environmental Foundation), as well as at its own stand just a stone's throw away. The exhibits at both stands attracted many visitors. The model of a FlokFormer was on display at the DBU stand, whereas a completely functional – and patented – pilot plant with a flocculation reactor was presented at the CUTEC stand. This plant has already undergone several successful practical tests on location and magically attracted visitors to the stand. Besides the major fields of waste and waste water, CUTEC also presented the ArtFuel model to the specialists among the visiting public in München. Moreover, various poster presentations provided insight into the diversified, applications-oriented scientific research at CUTEC.

The third fair with CUTEC participation was LIGNA, the world fair for the forestry and wood industry, which attracted more than 100 000 visitors to Hannover during the period from 2nd to 6th May. CUTEC was present at two joint stands at this fair, too. Besides the ArtFuel model at Lower Saxony's joint stand, the model of the "Energiepark Clausthal" was on display at the Storch Company's stand upon their invitation. This project is a ten-year joint venture, in which the energy demand at CUTEC-Institut is to be satisfied exclusively by drawing upon renewable energy sources. In this project, CUTEC is cooperating with institutes of the Technical University of Clausthal and with the Clausthal Public Utilities. In view of the enthusiastic response of the specialists among the visiting public to the CUTEC exhibits at all three fairs, many completed questionnaires have been evaluated during subsequent weeks, and contacts with many partners have been renewed and intensified during conversations at the fairs. In this year, too, project partners have certainly been found for joint ventures in the future, and CUTEC will surely be present with – at least – one stand at ACHEMA in Frankfurt in May 2006.

(he)

The rising generation of young scientists – a new promising platform for interdisciplinary cooperation and mutual interchange of experience

The up-and-coming generation of young scientists as a group – briefly designated as NaWis – at CUTEC was established in January 2005.

For a group of about ten persons, the incentive and motivation resulted from the fact that all are employed at the same company and are pursuing essentially the same objective: completion of their doctoral program. However, they were hardly aware of the functions of their individual colleagues or of the projects on which they are working. In order to actively deal with this situation, they decided to meet at fourteen-day intervals – the NaWis had been born!

However, it quickly became evident that each member had joined the NaWis with different objectives, priorities, and expectations. Consequently, the NaWis carefully formulated their objectives and submitted them to the Management in April.

The major objectives of NaWis are to improve the existing general conditions for doctoral candidates at CUTEC and to integrate their doctoral program into their everyday work. Of course, the group objectives also include the encouragement of scientific dialog and the exchange of experience. An instrument of this kind is well suited for fostering confidence and consolidating interdisciplinary work at CUTEC, for providing assistance during the execution of projects and, last but not least, for assuring quality in one's own work.

NaWis: designing the future!

The NaWis also devote their attention and effort to subjects which they regard as critical. With the objective of "social competence and networking", for instance, the NaWis promote joint interdisciplinary cooperation as well as improvement of internal communication.

The young scientists therefore maintain a close dialog with Professor Carlowitz, who has supported the initiative for a "rising generation" group from the very beginning. The NaWis report the results of their meetings to the Managing Director and submit their suggestions for possible improvements in internal procedures from the standpoint of the employees.

Initial success has already been achieved: Several young scientists have defined the title and content of their doctoral thesises together with Professor Carlowitz during the past six months and thus laid the foundation for their doctoral program.

The members of NaWis intend to continue their work on this basis and have comprehensive plans for the future, in keeping with the motto: NaWis – don't complain; get busy! (pe/rd)

Training at CUTEC

Today: Mr Mahlert in training in the Commercial and Accounting

Training opportunities for young people are limited in the Upper Harz Mountain Region. In this respect, too, CUTEC is well aware of its responsibility and has decided to provide for training as an accountant in management.

In January 2004, Dennis Mahlert could finally begin his training. He was already known at CUTEC and had also proved his ability as a helper. Thus, Mr Mahlert began his training as an accountant and became thoroughly familiar with the comprehensive field of personnel management during his first year of training. He learned how to file and maintain personnel documents, gained knowledge and experience in wage-and-salary accounting through intensive practice, and had to deal with questions of social insurance as well as numerous functions of the "internal services" at CUTEC. He became well acquainted with all fields of activity here.

Instructor Michael Röneke (l.) gladly takes the time to assist his trainee in his quest to learn

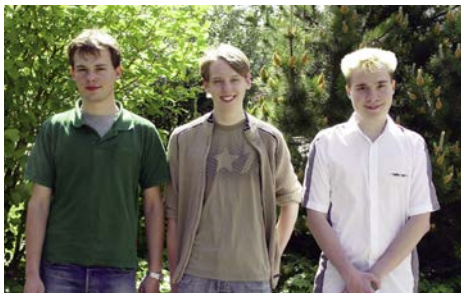
In his second year of training, Mr Mahlert is intensely involved with accounting procedures of all kinds. Thus, he is learning the complete processing sequence, from invoicing of accounts, booking of invoices received, through monthly settlements, all the way to the statement of accounts. Continuity with his first year of training is also ensured, for instance, when wages and salaries have to be booked.

Mr Mahlert also had the opportunity to apply his newly acquired skills to special tasks; thus, he has derived statistical data and singled out recent developments for the preparation of the balance sheets and their significance for CUTEC.

We wish Mr Mahlert every success in his final examination in the autumn of this year and the best of luck for his professional future.

For a young lady, this professional future began at CUTEC on 1st August 2005; Britta Kahla is Mr Mahlert's successor in training as an accountant. We likewise wish her every success. (so/rö)

The first step into professional life



Our practical trainees: Fidelis Süttmann, Oliver Börker und Torsten Schmidt

Dive into the cold water of professional life or take a cold shower before – which is more pleasant?

This question was also faced by Oliver Börker, Torsten Schmidt, and Fidelis Süttmann, as they began their practical training in management at CUTEC in August 2004. For a period of one year, the trio had the opportunity to "test" the real professional world, in order to gain insight into operational procedures. With appropriate guidance, they learned to work independently, to accept responsibility, and to develop their own ideas. We hope that we have thus contributed to their future and extend our sincere best wishes. (ws)

CUTEC hosts high-ranking guest from the Nigerian capital

Welcoming reception for the guest in front of CUTEC
From left: Prof. Carlowitz, Engr. Alhassan, and Dr. Onyeche

Engr. M.S. Alhassan is the "Executive Secretary" of the FCDA (Federal Capital Development Authority) and representative of the minister for the capital city of Abuja (Nigeria), Mallam el Rufai. The FCDA is responsible for the development of the new capital and is a direct subordinate of President Olusegun Obasanjo. Thus, Engr. Alhassan visited CUTEC as a leading thinker and decision maker in Nigeria's capital. Our relations with the densely populated African country with 120 000 000 inhabitants have developed over a period of several years – as reported in previous issues – and have already resulted in several projects. Hence, the welcome received by Engr. M.S. Alhassan from the Managing Director of CUTEC, Prof. Carlowitz, and the manager of international operations, Dr.-Ing. T. I. Onyeche, was all the more cordial (see photograph).

Back in December 2003, Engr. Alhassan had already taken part in a special training program at CUTEC for Nigerian executives. Although Abuja is Nigeria's most modern city, the environmental problems are immense, and the central government takes these problems very seriously. CUTEC's manager of international operations, Dr. Onyeche, has conducted extensive negotiations with the Nigerian Government with the objective of engaging CUTEC to serve as a competent partner for all environmental problems in Abuja. Prof. Carlowitz emphasised the company's wish for such an engagement in his welcoming address to Engr. Alhassan. He drew attention to the possibility of avoiding a repetition of past environmental damage whose elimination is so expensive in Europe today. During his visit, Engr. Alhassan was again highly impressed by the potential offered at CUTEC. He praised the company's excellent international activities, of which the Nigerian Government is well aware. Among other factors, his efforts to promote cooperation with CUTEC have been encouraged by the highly professional project execution in the Nigerian Federal State of Akwa Ibom. A new, previously planned landfill is under construction there under the direction of CUTEC and in cooperation with an engineering office in Lower Saxony (Prof. Hartung and Partners). (ca/he)

CUTEC BRIEF NOTES:

4th Telecolloquium: Networked Teaching and Learning in Lower Saxony

With the Clausthal Energy Park operated by CUTEC, the Technical University of Clausthal was one of six universities which participated in a telecolloquium on 7th July. The event was organised within the scope of the ELAN project on the topic of "Decentralised heat and power generation – a solution to future energy problems?!" By means of video conference technology, the participants at the various locations were mutually linked into a virtual round of discussion. Thus, talks were heard simultaneously at all six locations, and each was followed by a virtual discussion.

Prime Minister of Lower Saxony in Clausthal

On 1st June, Prime Minister Christian Wulff spoke on the topic of "Politics as a Christian Responsibility" in the completely filled lecture hall at CUTEC. He had been invited by the Evangelische Studentengemeinde (ESG) (Protestant Students' Association) Clausthal in the course of the interdisciplinary lecture series, "Science, Technology, and Ethics", which has been hosted by the ESG since 1997.

New in the CUTEC team

Male duet at work in the scientific and technical fields

Dr. rer. nat. Hadj Hamma Tadjine

Since September 2004, Dr. rer. nat. Hadj Hamma Tadjine has been working in the Modelling and Simulation Department at CUTEC. Dr. Tadjine studied electronics at the University of Blida in Algeria, where he received a degree in engineering. He then continued his studies at the same university and completed the program for his master's degree. After being employed in a scientific capacity at various institutes and companies in Algeria, he came to the Federal Republic of Germany in 2001. He received his doctor's degree at the Institute of Computer Science at the Technical University of Clausthal.

In the Modelling and Simulation Department, Dr. Tadjinei has been supporting the successful work in research and development.

Since 1st March 2005, Guido Lücker has been employed as technician in the Department of Thermal Processes. Among other duties, his functions include repair, maintenance, and servicing of the pilot plants as well as the construction and initial operation of new plants and modules. Moreover, he participates in the measurements performed by the § 26 Measuring Unit and those performed with the high-temperature endoscope. (he/wes)

Guido Lücker

We extend our congratulations to…

… Dipl.-Ing. Annett Wollmann on the completion of her studies in process engineering with special emphasis on particle technology, heterogeneous catalysis, and non-catalytic gas-solid reactions. The results from her Diplom dissertation were published in September.

Mrs Wollmann is employed in the Department of Chemical Processes in the field of particle technology, where she has specialised in Diesel particle filter systems. Moreover, she is co-author of diverse scientific publications. (he/wes)